Project Title: “Functional organization of neural circuits in the mouse accessory olfactory bulb”

Awarded: July 1, 2011

Project Description (from NIH RePORTer) The overall goal of this research and training plan is to gain better understanding of the organization and function of the mouse accessory olfactory system (AOS). The AOS is a compact neural pathway that communicates directly with brain regions that govern so-called "intrinsic" social and reproductive behaviors. By increasing knowledge about sensory processing in the mouse AOS, this project will shed light on principles of mammalian olfaction, and will improve our understanding of links between sensation and behavior. The investigator, ..., will gain up to two years of advanced postdoctoral training in the design and implementation of planar illumination microscopy and transgenic mice in support of an innovative approach using live neuronal calcium imaging to study inhibitory interneurons in the mouse accessory olfactory bulb. Two sponsors for this training were chosen, Dr. Timothy Holy and Dr. Daniel Kerschensteiner that have strong experience in the fields of optical design and transgenic mouse production, respectively. Several hypotheses will be tested during the mentored and independent phases of this award. One main hypothesis links sensory "receptive fields" to axonal projection patterns in the brain. Testing several other hypotheses will identify specific sensory processing roles for the various interneuron populations in the accessory olfactory bulb. Testing these hypotheses will establish principles of mammalian social odor processing, and will help us to understand the functions that inhibitory neurons provide for sensory neural circuits. Through this research and mentored training plan, we will produce valuable new data on AOS sensory processing, and will establish new experimental tools and approaches that will form a foundation for a career as an independent scientist.

PUBLIC HEALTH RELEVANCE: This research and training plan will provide advanced training in live neuronal imaging and transgenic animal design that will support a career in cutting-edge sensory neuroscience. The innovative approaches used to study distinct populations of interneurons in the mouse accessory olfactory bulb will provide new insight into mammalian olfaction, and will produce greater understanding of sensory processing in the mammalian brain.